A STUDY TO ASSESS THE EFFECTIVENESS OF LADY'S FINGER JUICE IN REDUCING THE BLOOD GLUCOSE LEVEL AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN SELECTED VILLAGES AT KANYAKUMARI DISTRICT

A DISSERTATION SUBMITTED TO THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILLMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

OCTOBER 2016

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2014-2016

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Internal Examiner **External Examiner**

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CERTIFICATE

This is to certify that the dissertation entitled, **"A study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with type II diabetes mellitus in selected villages at Kanyakumari district"** is a bonafide work done by Mrs. Subha. R.C, II year M.Sc (N), Global College of Nursing, Nattalam in partial fulfilment of the University rules and regulations for the award of M.Sc (N) degree under my guidance and supervision during the academic year October 2014-2016.

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Prof. Mrs. Berlin.P, M.Sc (N),

Date with seal:

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Date:

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ABSTRACT

INTRODUCTION

Diabetes mellitus is a chronic multisystem disease related to abnormal insulin production, impaired insulin utilization, or both. Type II diabetes mellitus is defined as a heterogeneous disorder involving both genetic and environmental factors and it previously called non-insulin dependent diabetes mellitus or adult-onset diabetes.

STATEMENT

A study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with type II diabetes mellitus in selected villages at Kanyakumari district.

OBJECTIVES

- To assess the pre and post test blood glucose level among clients with Type II diabetes mellitus in experimental and control group.
- To determine the effectiveness of lady's finger juice on blood glucose level among clients with Type II diabetes mellitus in experimental and control group.
- To find out the association between the pre test blood glucose level among clients with Type II diabetes mellitus with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

RESEARCH METHODOLOGY

The research design adopted for this study was true experimental design. The sample size was 60 and was drawn through simple random sampling technique. The feasibility of the study and the refinement of the tool were assessed through pilot study. The blood glucose level among Type II diabetes mellitus clients was assessed by using glucometer.

The data collection for the main study was done from 01-04-2016 to 30-04-2016. Lady's finger juice was given for experimental group. Post test was done after

intervention period. The data gathered were analyzed by descriptive and inferential statistical method.

FINDINGS OF THE STUDY

In Experimental group the mean score on blood glucose level among clients with Type II diabetes mellitus was 153 in pre test and 128.20 in post test. The paired‘t’ value was 13.76 which is significant at p >0.05. In Control group the mean score on blood glucose level among clients with Type II diabetes mellitus was 147.63 in pre test and 154.06 in post test. The paired‘t’ value was 3.99 which is significant at p >0.05. It shows that lady’s finger juice was effective in reducing the blood glucose level. The mean score on blood glucose level among clients with Type II diabetes mellitus in Experimental group was 128.20 in post test and 154.06 in Control group post test. The estimated value was 6.93 which is significant at P> 0.05. It shows that lady’s finger juice was effective in reducing the blood glucose level. There is no association between the pre test blood glucose level among clients with Type II diabetes mellitus in experimental group and control group with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

CONCLUSION

This study inference revealed that regular practice of lady’s finger juice could bring about desired reduction in the blood glucose level among clients with Type II diabetes mellitus.

CHAPTER - 1

INTRODUCTION

"Every human being is an author of his own health''

-Hendry

Good health is a pre requisite of human productive and development process. In the past most individuals and societies viewed good health or wellness as the opposite or absence of disease. Health is a multidimensional concept and must be viewed from broader perspective. An assessment of the clients state of health is an important aspect of nursing. (Polit. F. Denise, 2008)

Diabetes mellitus is defined as a variable disorder of carbohydrate metabolism caused by a combination of hereditary and environmental factors and usually characterized by inadequate secretion or utilization of insulin, by excessive urine production, by excessive amounts of sugar in the blood and urine, and by thirst, hunger, and loss of weight. (Siddartha, 2010)

Diabetes mellitus is chronic multisystem disease related to abnormal insulin production, impaired insulin utilization, or both. Type 1 and type 2 are the two classifications of diabetes mellitus. Type 2 diabetes mellitus is defined as a heterogeneous disorder involving both genetic and environmental factors and it previously called non-insulin dependent diabetes mellitus or adult-onset diabetes. (Lewis, 2008)

The prevalence of Type 2 diabetes worldwide has more than doubled since 1980, climbing from an estimated 153 million three decades ago to about 347 million in 2008. According to WHO report, today around 346 million people worldwide have diabetes. In 2004, an estimated 3.4 million people died from consequences of high blood sugar. About one in every 10 men around the world and one in every 11 women suffers from this disorder. In 2002, more than 18 million Americans 6.9% of the U.S. population have diabetes. (Sandeep.S, 2013)

India tops the list of 10 countries in numbers of suffers. According to the Diabetes Atlas published by the International Diabetes Federation, the number of

people with diabetes in India currently is around 40.9 million and is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. India leads the world with largest number subjects of being termed the “Diabetes capital of the world”. (Deepa, 2012)

Consumption of the indigenous plant materials are in use for the management of diabetes mellitus. Lady finger is considered as one of the most popular alternative therapies for Type 2 diabetes mellitus. The mucilage and superior fibre found in lady’s finger is believed to stabilize blood glucose; at which glucose is absorbed from the intestinal tract. Lady finger is a member of the family Malvaceae, and is believed to originate from south eastern part of North America. It is extensively used globally as a vegetable for its nutritional and health benefits. (Rahman.A, 2010)

Many patients try alternative medicine for diabetes control. Numerous herbal remedies, non-herbal remedies, and other approaches have been tested, and some seem to have anti-diabetes effects. Lady finger is one of the good herbal remedy for diabetes. (Rahman.A, 2010)

"Lady’s finger", also known as “Okra”, is one of the highly nutritious vegetables, usually eaten while the pod is green, tender, and immature. Botanically, this perennial flowering plant belongs to the Malvaceae (mallows) family and named scientifically as Abelmoschus esculentus. (Rahman.A, 2010)

Lady’s finger is one of the vegetable that breaks down starches before they ever get the chance to turn into glucose in the blood stream. The seeds are full of alpha-glucosidase inhibitors. They prevent starches from converting to glucose-sugar in the blood stream. Lady’s finger can dramatically lower blood glucose levels. They’re even looking as a potential alternative treatment for Type II Diabetes mellitus.(Wikipedia)

In vitro study of the effects of viscous soluble dietary fibres of Abelmoschus esculentus (Lady’s finger), found out that there is a substantial reductions of diffusion of glucose from water soluble portion of the pods of Abelmoschus esculentus and Na-Carboxy methylcellulose (Na-CMC) and viscous soluble dietary fibres (VSDF) of the fruits of Abelmoschus esculentus on intestinal glucose absorption using in vitro model. Diffusion systems were observed compared to control in a concentration-

dependent manner (P<0.05) which implicates a possible potential role of viscous soluble dietary fibres (VSDF) of fruits of Abelmoschus esculentus in lowering random serum glucose. (Hajeera.K, 2010)

NEED FOR THE STUDY

Diabetes mellitus is a chronic multisystem disease related to abnormal insulin production, impaired insulin utilization, or both. According to statistics from the International Diabetes Federation (IDF), India has more diabetes than any other nation of the world. Current estimates peg the number of diabetes in the country at about 62 million-an increase of over 10 million from 2011 when estimates suggested that about 50.8 million people in the country were suffering from the disease. (Deepa, 2012)

Globally in 2013, it is estimated that almost 382 million people suffer from diabetes for a prevalence of 8.3%. North America and the Caribbean is the region with the higher prevalence of 11% having 37 million people with diabetes followed by the Middle East and North Africa with a prevalence of 9.2% having 35 million people with diabetes. (Wikipedia)

In national diabetes data group the prevalence of diabetes among the adult male in the year 2010 was found to be 57% whereas that of females was 43%.Around 3.2 million deaths every year are attributable to complications of diabetes: six deaths every minute. (Shamima Akter, 2015)

In India, the prevalence of diabetes in rural populations is one-quarter that of urban population for India and other Indian sub-continent countries such as Bangladesh, Nepal, Bhutan, and Sri Lanka. Preliminary results from a large community study conducted by the Indian Council of Medical research (ICMR) revealed that a lower proportion of the population is affected in states of Northern India (Chandigarh 0.12 million, Jharkhand 0.96 million) as compared to Maharashtra (9.2 million) and Tamil Nadu (4.8 million). The National Urban Survey conducted across the metropolitan cities of India reported similar trend: 11.7 per cent in Kolkata (Eastern India), 6.1 per cent in Kashmir Valley (Northern India), 11.6 per cent in New Delhi (Northern India), and 9.3 per cent in West India (Mumbai) compared with (13.5 per cent in Chennai (South India), 16.6 per cent in Hyderabad (south India), and 12.4 per cent Bangalore (South India). (Sujatha 2015)

In Tamil Nadu state, low and middle income countries, the number of people with diabetes in urban areas is 181 million, while 122 million live in rural areas. The prevalence of diabetes in urban areas ranged from 10.9 to 14.2% while in rural areas the range was 3.0 to 8.3%. a rural to urban gradient has also been observed from Tamil Nadu, where the prevalence of diabetes in peri-urban villages and cities in the state of Tamil Nadu reported as 9.2% and 16.4% respectively. In the urban areas, the increase in prevalence of diabetes is evident from findings of periodic population based studies performed in the city of Chennai in south India in last two decades. In those studies the prevalence of diabetes increased from 8.3% in 1989 to 18.6% in 2006. Also, the age at detection of diabetes had decreased over this period of urban areas suggesting nearly 5% diabetes prevalence in the age group of 45-60 years. While rural areas have a lower prevalence of diabetes, there are variation of prevalence by region ranging from 9.2-13.3%. (Shankar Radha Krishnan, 2010)

In Kanyakumari district, among the tribal population, showed that the prevalence was 9.8% and 2.5% respectively with higher prevalence among female population when compared with male population, which has shown gender specificity among the diabetes prevalence. The rural population is also at a high-risk for developing diabetes mellitus. The prevalence of diabetes 41.96% was found in the age group of 45-60 years. Rural population remains exposed to high level of blood glucose for long time due to lack of screening facility of diabetes than in urban population. (Jerlin Nirmala, 2012)

In Palliyadi village, the total number of population under the Primary health centre is 43,363. Nearly half of them are belongs to Type II diabetes mellitus. 1314 new cases were identified in this year 2016 as Type II diabetes mellitus.

Sarika Davis (2015), conducted a study to assess the effectiveness of lady's finger juice in the control of blood glucose among Type 2 diabetes mellitus clients aged 45-60 years in selected areas of Mangalore. A quasi experimental research approach with purposive sampling technique was used. Data collection was done by baseline proforma, compliance diary and random blood glucose monitoring chart. The results revealed the mean random blood glucose value of the experimental group in the pretest (219.3±69.3) on the first day and post test (199±67.9) on the 30th day .The

study shows that the decline in the mean random blood glucose value in the experimental group due to the administration of lady's finger juice .

Jegadeesh Ramasamy (2010), conducted a study on exploratory investigation on the hypoglycemic effect of a common food item known as okra or Abelmoschus esculentus. Sixty clients were randomly selected and grouped into 2 groups and were given extracts from the fruit of Abelmoschus esculentus which was cut into two pieces and was soak in 150ml potable water overnight. 1st group is the Control Group and the 2nd group is the Treatment Group. Average results of the two groups are determined and recorded upon conducting this experimental research. The Control Group has an average result of 94mg/dl in the 1st test(pre test) and 99mg/dl in the 2nd test(post test), The Treatment Group has an average result of 115mg/dl in the 1st test(pre test) and 88mg/dl in the 2nd test (post test). The results indicated that the extract from Abelmoschus esculentus has hypoglycemic effect to reduce the Type II diabetes mellitus. There is a significant difference between the two groups ($P<0.001$). The study concluded that Abelmoschus esculentus has an hypoglycemic effect to reduce the Type II diabetes mellitus.

During the community posting the investigator experienced that most of the adults were suffered from Type II diabetes mellitus between the age group of 45-60 years. So the researcher interested to do some of the alternative therapy to reduce the risk of Type II diabetes mellitus.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanyakumari district.

OBJECTIVES

- To assess the pre and post test blood glucose level among clients with Type II diabetes mellitus in experimental and control group.
- To determine the effectiveness of lady's finger juice on blood glucose level among clients with Type II diabetes mellitus in experimental and control group.

- ❖ To find out the association between the pre test blood glucose level among clients with Type II diabetes mellitus with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

HYPOTHESIS

H1: There will be a significant difference in pre and post test blood glucose level among clients with Type II diabetes mellitus in experimental and control group.

H2 : There will be a significant difference between post test blood glucose level among clients with Type II diabetes mellitus in experimental and control group.

H3 : There will be a significant association between pre test blood glucose level among clients with Type II diabetes mellitus with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

OPERATIONAL DEFINITIONS

1. Effectiveness

Effectiveness is the capability of producing a desired result. When something is deemed effective, it means it has an intended or expected outcome, or produces a deep, vivid impression (Wikepedia).

In this study effectiveness refers to the effect of lady's finger juice among clients with Type II diabetes mellitus. The outcome is measured in terms of difference between pretest and post test of blood glucose level.

2. Blood glucose

The blood glucose level is the amount of glucose present in the blood of a human. The body naturally tightly regulates blood glucose levels as a part of metabolic homeostasis (Wikipedia).

It refers to the level of glucose in the blood. i.e., Random blood glucose ranges from 121-180mg/dl.

3. Type II diabetes mellitus

Type II diabetes mellitus is commonly referred to as diabetes, is a group of metabolic diseases in which there are high blood glucose levels over a prolonged period (Wikipedia).

It refers to the client in which newly diagnosed cases of without taking any medications and the random blood glucose is between the range of 121-180mg/dl.

4. Lady's finger juice

It is the member of the malvaceae family, it is extensively used globally as a vegetable for its nutritional and health benefits (Wikipedia).

In this study 150ml of lady's finger juice will be consumed by the client in the early morning before breakfast for 30 days.

Preparation:

Lady's finger juice is prepared by one medium sized lady's finger. Take two pieces of lady's finger and remove or cut both ends of each piece. Also put a small cut in the middle and put these two pieces in glass of water (150ml). Cover the glass and keep it in room temperature overnight. Early morning, before breakfast simply remove two pieces of lady's finger from the glass and drink that water.

ASSUMPTIONS

- Type II diabetes mellitus may be a common problems among the age group of 45-60 years.
- Lady's finger juice may have positive effect in reducing blood glucose level among clients with Type II diabetes mellitus.

DELIMITATIONS

The study is delimited to

- clients with Type II diabetes mellitus aged 45-60 years.
- whose blood glucose level ranges from 121-180mg/dl.
- those who are not taking the medication.

- only two villages such as Cherikadai and Alathurai village at Kanyakumari district.
- only one month duration for data collection.

CONCEPTUAL FRAMEWORK

The conceptual framework is a group of concepts and a set of preposition that spells out the relationship between them. The overall purpose is to make scientific findings, more meaning and generalizable. (Polit and hungler, 1995)

It is the process of forming ideas. The major goal of her conceptual model acts as a guide to research process. The major goal of the conceptual framework are to clarify the concepts used in the study to find the purpose and relationship between the concepts. The present study was aimed to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanyakumari district. The framework of the study is based on the general system theory. (Ludwig Von Bertalanffy)

According to general system theory, a system is a set of units interacting with each other within a boundary that fillers the kind and the rate of flow of input and output to form the system.

General system theory is useful in breaking the whole processes in parts to ensure goal realization. The number of parts of the system is totally dependent on what is needed to accomplish for any system to function. The aim of the study is to assess the effectiveness of lady's finger juice on blood glucose level among clients with Type II diabetes mellitus residing in selected villages at Kanyakumari district. The Bertalanffy explained that the system has four major aspects.

1. Input
2. Throughput
3. Output
4. Feedback

Input

It is the type of information that enter into the system from the environment through its boundaries. In this study input refers to the administration of 150ml of lady's finger juice.

Throughput

Throughput makes use of persons processes and effectors processes refers to the control mechanism that a person uses as an adaptive system. Effect or refers to the physiological function self concept and role confusion involves in adaptation. In this study throughput refers to the process of administration of 150ml of lady's finger juice before breakfast for 30 days.

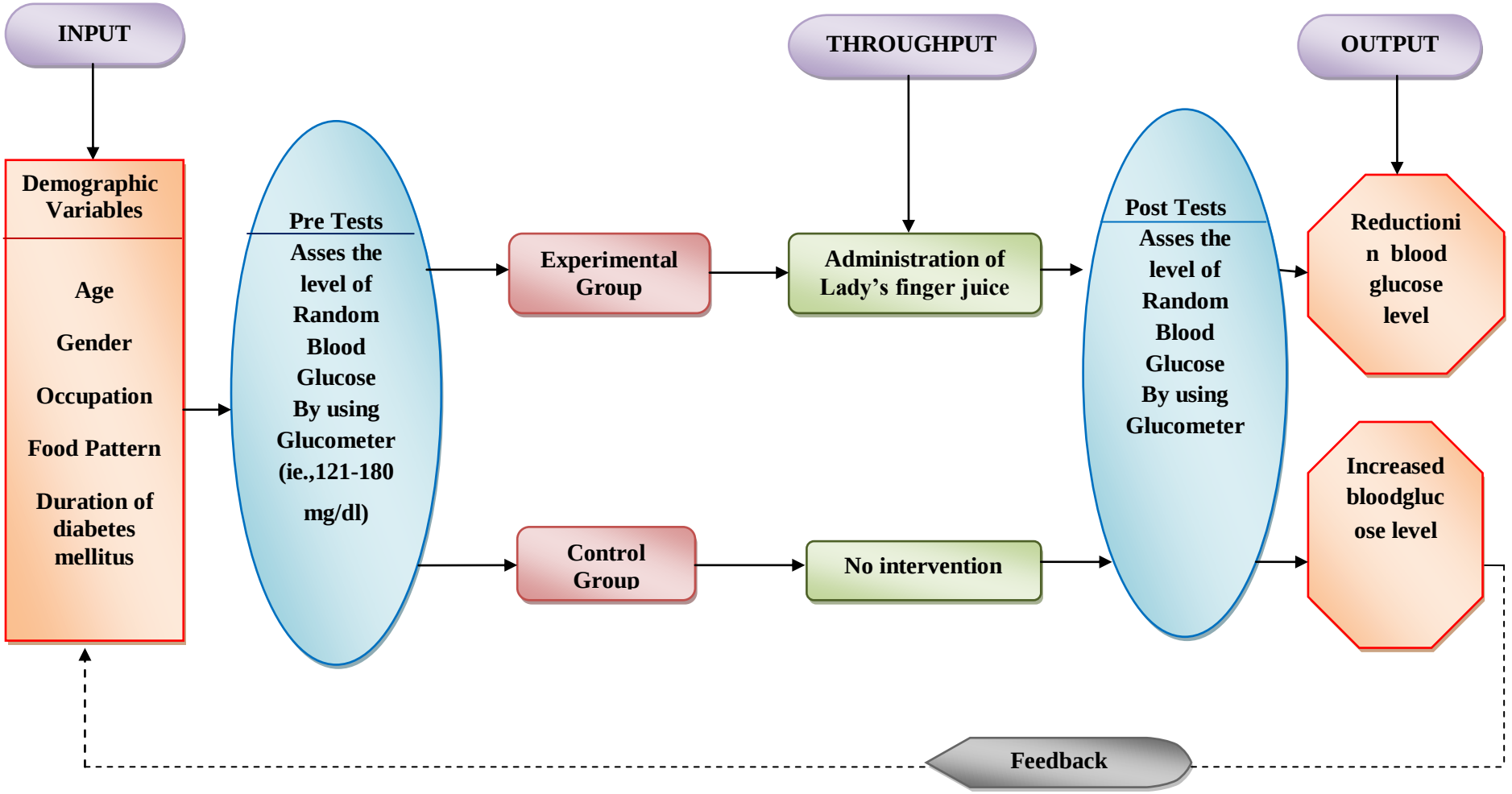
Output

Output is any information that leaves the system and enters the environment through system boundary. In this study output is nothing but evaluation, which determined the degree to which extend outcomes are attained.

Feed back:

Feed back refers to the output that is returned to the system and it allows it to monitor itself. In this study the feed back is reduction of blood glucose level.

MODIFIED CONCEPTUAL FRAME WORK BASED ON LUDWIG VON BERTALANFFY'S [1968] GENERAL SYSTEM THEORY



CHAPTER - II

REVIEW OF LITERATURE

The literature review involves the systematic identification, location, scrutiny and summary of written materials that contain information of a research problem **(Polit and Hungler 2004).**

A review of literature is a key step in research process and it refers to extensive, exhaustive and systemic examination of publications relevant to research project. This chapter deals with the review of literature so as to gain an insight into the various aspects of the problem understudy such as design, methods, instruments measures and techniques of data collection that may prove useful in the proposed project.

The review of literature provides a basis for future investigations, justifies the need for replication, throws light on the feasibility of the study, indicates constraints of data collection and helps to relate findings of one study to another. It also helps to establish a comprehensive body of scientific knowledge in a professional discipline from which valid and pertinent theories may be developed.

The researcher presents the review of literature for the present study under the following headings.

1. Studies related to Type II diabetes mellitus
2. Studies related to Lady's finger juice
3. Studies related to Lady's finger juice on Type II diabetes mellitus.

Section-A: STUDIES RELATED TO TYPE II DIABETES MELLITUS

Badr Aljasir (2015), conducted a study on the effect of practicing yoga for the management of Type II diabetes mellitus. All randomized controlled clinical trials (RCTs) comparing yoga practice with other type of intervention or with regular practice or both, were included. Each study was assessed for quality by two independent reviewers. Mean difference was used for summarizing the effect of each study outcomes with 95% confidence intervals. Five trials with 360 participants met

the inclusion criteria with medium to high risk of bias and different intervention characteristics. The studies results show improvement in outcomes among patients with diabetes type II. These improvements were mainly among short term or immediate diabetes outcomes and not all were statistically significant. The results were inconclusive and not significant for the long-term outcomes. The result shows that short-term benefits for patients with Type II diabetes may be achieved from practicing yoga.

Saiyad Shah Alam and Hamiduddin (2015), conducted a descriptive study on importance of Raw Papaya Dressing in Diabetic Foot Ulcer. The management of diabetic foot ulceration is based on the control of blood sugar, wound debridement, identification and management of infection, proper dressing and definitive wound closure. The study of diabetic foot ulceration involved a convenience sample of 61 adult men and women with 58 type 2 diabetes mellitus, 24 with existing foot ulcers and 37 without foot ulcers who resided in a rural areas. Out of a possible score of 20, those with foot ulcers scored an average of 13.88 and those without ulcers averaged 13.57. The result predicts that there is a significant difference between the two groups ($P<0.05$). The study concluded that the raw papaya dressing was effective in diabetic foot ulcer.

Sucheta Soma Kirupa. L and Kavitha. R (2014), conducted a study to analyse the hypoglycemic effect of murraya koenigii (curry leaf powder) in patients with Type II diabetes mellitus. 20 male patients with Type II diabetes mellitus in the age group of 51-62 years formed the samples for the study.15 g of curry leaf powder was supplemented for a period of 30 days for the Diabetic Experimental Group (DEG)(n=10). The Post Prandial Blood Glucose levels were recorded for both control and experimental before supplementation. The glucose level before lunch and 2 hrs after lunch was recorded on Day 0 and Day 30 of the supplementation period. The result shows that a significant change in the Post Prandial glucose levels in the DEG after the supplementation period was found. Also a significant decrease in both the pre-lunch and post-lunch glucose levels was noted. A significant difference in the Post Prandial blood glucose levels was also observed. The study concluded that curry leaf powder had the property to decrease the blood glucose level and is the dietary adjunct in the management of Type II diabetes mellitus.

Zar Chi Thent (2013), conducted a study on Exercise training programs have emerged as a useful therapeutic regimen for the management of type 2 diabetes mellitus (T2DM). Twenty five cases met the selected criteria. The investigator selected randomized controlled trial study. Resistance exercise proved to have positive effect on T2DM patients. The study concluded that exercise is the best management to decrease the Type II diabetes mellitus.

Yulia Treister-Goltzman (2012), conducted a study to determine the effects of self care management of type 2 diabetes mellitus. The systematic literature review aims to identify the self-care management to improve type 2 diabetes mellitus.60 samples were selected based on randomized controlled trials. 30 are in experimental group and 30 are in control group. The experimental group has an successful outcome through self care management but the control group remains the same. There was a statistically significant difference between the two groups (P<0.001).The result shows that the self care management was reduced the type 2 diabetes mellitus.

Saurabh RamBihariLal Shrivastava (2011), conducted a study on self care behaviours of people with type II diabetes mellitus. Diabetes mellitus (DM) is a chronic progressive metabolic disorder characterized by hyperglycemia mainly due to deficiency of insulin hormone. World Health Organization estimates that more than 346 million people worldwide have DM. The needs of diabetic patients are not only limited to adequate glycemic control but also correspond with preventing complications; disability limitation and rehabilitation. There are seven essential self-care behaviors in people with diabetes which predict good outcomes namely healthy eating, being physically active, monitoring of blood glucose, compliant with medications, good problem-solving skills, healthy coping skills and risk-reduction behaviors. All these seven behaviors have been found to be positively correlated with good glycemic control, reduction of complications and improvement in quality of life. The study shows that the self care behaviours in people with diabetes predicts good outcomes of reducing type II diabetes mellitus.

Paturi.V.Rao (2010), conducted a study on fenugreek seed powder can reduce the Type II diabetes mellitus. A one month randomized, controlled, parallel study for effectiveness of Fenugreek seed powder (n=66) and matched controls

(n=74) was conducted in men and women aged 30-70 years with criteria of diabetes. Fenugreek seed powder, 5 g twice a day before meals, was given to study subjects and progression of Type II diabetes mellitus was monitored after 30 days. The result predicts that there is a significant reduction in fasting blood glucose after intake of fenugreek seed powder. The study concluded that the fenugreek seed powder was effective in reducing the Type II diabetes mellitus.

Uma (2010), conducted a study to assess the impact of Amla Juice in the management of Type II Diabetes mellitus subjects. A total of 55 stable Type II Diabetes were enrolled from pathology laboratories are were given either fresh amla juice (N=15) for 45 days or processed Amla Juice (N=20) for 90 days and compared with diabetic controls (N=20). Anthropometric profile, glycaemic status and lipid profile were assessed on all subjects at baseline, 45 days and 90 days. The results indicated that fresh amla juice or processed amla juice supplementation for long-term had significant impact on the glycaemic and lipedemic status of diabetic subjects. Thus, the protective effects are lost with processing, and therefore, these plant sources should be consumed in their natural form. The study concluded that Amla Juice was effective in reducing the Type II diabetes mellitus.

Section-B: STUDIES RELATED TO LADY'S FINGER JUICE

Bandar Al Shehri (2014),conducted a comparative study on alpha-glucosidase and alpha-amylase enzyme inhibitory effects in aqueous extracts of Abelmoscus esculentus (lady's finger) Moench, to provide an evidence for antidiabetic activity through potential inhibition of alpha-glucosidase and alpha-amylase enzymes using the aqueous extracts of Abelmoschus esculentus (L.) Moench (A. esculentus) peel (AAPP) and seed (AASP). The powdered peel and seed were used for the preparing the aqueous extract. The study concluded that the Abelmoschus esculentus peel and Abelmoschus esculentus seed showed appreciable alpha-glucosidase [IC50 = (142.69±0.32) mg/mL and (150.47±0.28) mg/mL] and alpha-amylase [(IC50 = (132.63±0.16) m g/mL and (147.23±0.21) mg/mL] inhibitory effect in a Abelmoschus esculentus peel and Abelmoschus esculentus seed concentration-dependent manner, and confirmed the hypoglycaemic effect in the aqueous extracts of Abelmoschus esculentus.

Srijit Das (2013), conducted a experimental study on research framework to investigate the differential expression in streptozotocin induced diabetic client in response to Abelmoschus esculentus treatment. The hypoglycaemic effect of water extracts prepared from the fruit of Abelmoschus esculentus was studied in the diabetic clients. All cases were randomly divided into three groups: normally healthy group(N group), streptozocin induced diabetic group and Abelmoschus esculentus treated diabetic group(AE group).Oral application of Abelmoschus esculentus at doses of 100,150,200 mg/kg body weight was given to Abelmoschus esculentus treated diabetic group by single and repeated oral administration. The study concluded that the expected findings from both in vivo and molecular studies may reveal the anti diabetic properties of the Abelmoschus esculentus and suggest that the plant extract may be used for the management of disease.

Leonard Joseph Henry (2011), conducted a retrospective study on nutritional properties of Abelmoschus esculentus as remedy to manage diabetes mellitus. The Diabetes Association of Malaysia in the year2009 reported that diabetes may affect 1.2 million Indians and this disease can be developed from as early as seven years old. Many of the side effects of diabetes can be prevented if glucose levels at normal range are being controlled. This is possible by using natural plants and herbal supplements as the alternative way to manage end control diabetes. It was also reported that in south east Asia region, herbal medicines such as Ampalaya leaves and Abelmoschus esculentus, were commonly used to treat diabetic patients. The study shows that Abelmoschus esculentus has a hypoglycemic effect to reduce diabetes mellitus with the help of Ampalaya leaves and Abelmoschus esculentus.

Roni Peleg (2010), conducted a study to evaluate the effectiveness of Abelmoschus esculentus in reducing the blood cholesterol.40 clients with ages of 45 to 70 had been selected for this study.20 clients is of in control and the remaining 20 clients use Abelmoschus esculentus. The result predicts that the long-term effects shows that there is a significant difference of the table value ($P<0.05$) when compared with two groups. The duration of the study was 60 days. The study concluded that Abelmoschus esculentus is effective in reducing the level of cholesterol in blood.

Lisa Manuel (2008), conducted a comparative study to assess the effectiveness of Abelmoschus esculentus can reduce the blood cholesterol and the

diabetes mellitus. In this study 20 patients were selected for follow up on the basis of inclusion & exclusion criteria.10 were assigned for control group and the other 10 were assigned for experimental group. The treatment was given for 3 months time period. The parameter evaluated was post prandial blood glucose. The result predicts that there was a significant difference between the two groups of reducing the blood cholesterol and the diabetes mellitus ((P<0.05). The study was concluded that Abelmoschus esculentus was effective in reducing the level of blood cholesterol and diabetes mellitus.

Kassaian (2007), conducted a study to evaluate the lady's finger juice in peptic ulcer patients, 24 clients were taken the lady's finger juice for 8 weeks. The differences observed using paired-t-test was considered as significant. Findings showed that fasting blood glucose decreased significantly (25 %, 30 % and 30.6% respectively) after taking lady's finger juice whereas there was a significant changes in cases consumed lady's finger juice. This study shows that lady's finger juice can be used as an adjuvant in the control of peptic ulcer.

Losso (2006), conducted a study on lady's finger juice. Eight subjects of anaemia were selected and administered the lady's finger juice. Blood value were tested periodically over a period of weeks after consumption. The tests were run on two occasions I week apart. The study was randomized and balanced. This study shows that there is a significant difference of the subject with anemia consuming the lady's finger juice (p <0.05). The result shows that lady's finger juice was effective in reducing the anaemia.

Bawadi H et.al (2005), conducted a quasi experimental study on beneficial effect of lady's finger juice in reducing asthma, lady's finger juice have been reported to be beneficial for treating asthma. 166 clients were assigned into two groups of experimental and control. Participants were instructed to drink the lady's finger juice. The study shows that there is a significant difference of the clients with asthma who was consuming the lady's finger juice (p>0.05). The study concluded that lady's finger juice was effective in reducing the asthma.

Section-C: STUDIES RELATED TO LADY'S FINGER JUICE ON TYPE II DIABETES MELLITUS

Sharma.R.D (2015), conducted a study to assess the effectiveness of lady's finger juice in the control of blood glucose among type 2 diabetes mellitus clients aged 45-60 years in selected areas of Bangalore. A quasi experimental research approach with purposive sampling technique was used. Data collection was done by baseline proforma, compliance diary and random blood glucose monitoring chart. The results revealed the mean random blood glucose value of the experimental group in the pretest (212.3±69.3) on the first day and post test (180±67.9) on the 30th day .The study shows that the decline in the mean random blood glucose value in the experimental group due to the administration of lady's finger juice .

Souraya Sidani (2014), conducted a comparative study on glucose, insulin, and non-esterified fatty acid responses to lady's finger in type 2 diabetes mellitus. Glycaemic index (GI) and insulin (as measured by C-peptide) responses of lady's finger (Abelmoschus Escullentus) from Bangladeshi origin were investigated to help in creating a better food exchange table for diabetic patients. Sixty diabetic subjects, under a cross-over design, consumed equi-carbohydrate amount (25 gram of total carbohydrate) of the vegetables with a run in period of seven days between the consecutive items. The serum level of glucose were estimated at 0.0, 15, 30, 45, 60, 90, 120, 150 and 180 min, respectively. The result shows that lady's finger showed significantly lower serum glucose value. The study shows that for type 2 diabetes mellitus patient's blood glucose response after consuming ladies finger was significantly lower.

Prateek Saurabh Shrivastava (2013), conducted an experimental study on Lady's finger juice reduce the Type II diabetes mellitus. The researcher identified sixty samples of Type II diabetes mellitus and separated them in two groups.30 samples was in control group and 30 samples was in experimental group. In experimental group the lady's finger juice has been administered and the control group there is no intervention. The investigator found that there is a significant difference between two groups ($P<0.05$). The duration of the study was one month. The study concluded that Lady's finger juice was effective in reducing the Type II diabetes mellitus.

Zargar.H et.al (2012), conducted a study on exploratory investigation on the hypoglycemic effect of a common food item known as Abelmoschus esculentus (EA). Sixty clients were randomly selected and grouped into 2 groups and were given extracts from the fruit of Abelmoschus esculentus (EA) which was cut into two pieces and was soak in 250ml potable water overnight. 1st group is the Control Group and the 2nd group is the Treatment Group. Average results of the two groups are determined and recorded upon conducting this experimental research. The Control Group has an average result of 94mg/dl in the 1st test(pre test) and 90mg/dl in the 2nd test(post test), The Treatment Group has an average result of 120mg/dl in the 1st test(pre test) and 88mg/dl in the 2nd test (post test). The results indicated that the extract from Abelmoschus esculentus (EA) has hypoglycemic effect to reduce the type II Diabetes mellitus. There is a significant difference between the two groups ($P<0.001$). The study concluded that Abelmoschus esculentus has an hypoglycemic effect to reduce the type II Diabetes mellitus.

Vivan Wing Sheung Chan (2012), conducted a randomized study on the effectiveness of Abelmoschus esculentus reduces the type II diabetes mellitus. A sample of 32 cases was randomly divided into two groups. One group was treated with Abelmoschus esculentus and the other group remains in control, for 30 days. Intervention was given between the treatment groups. The result predicts that there is a significant difference between the two groups ($P<0.05$) on fasting blood glucose levels. The study concluded that Abelmoschus esculentus was an effective treatment for reducing the type II diabetes mellitus.

Pannerselvam. K (2011), conducted a study to assess the effectiveness of Lady's finger juice on type II diabetes mellitus clients. The researcher identified sixty samples of type II diabetes mellitus and separated them in two groups.30 samples was in control group and 30 samples was in experimental group. A quasi experimental research approach with purposive sampling technique was used. In experimental group the lady's finger juice has been administered and the control group there is no intervention. The result predicts that there is a significant difference between two groups ($P<0.05$). The duration of the study was 45 days. The study concluded that Lady's finger juice was effective in reducing the type II diabetes mellitus.

Maggie Bryson (2010), conducted a study on glucose, insulin, and non-esterified fatty acid responses to lady's finger in type 2 diabetes mellitus. Glycaemic index (GI) and insulin responses of lady's finger (abelmoschus esculentus) were investigated to help in creating a better food exchange table for diabetic patients. Ten diabetic subjects, under a cross-over design, consumed equi-carbohydrate amount (25 gram of total carbohydrate) of the vegetables with a run in period of seven days between the consecutive items. The serum level of glucose were estimated. Lady's finger showed significantly lower serum glucose value. This study shows that for type 2 diabetes mellitus client's blood sugar response after consuming lady's finger was significantly lower.

Shweta singh (2010), conducted a study regarding mechanism of action of lady's finger juice to reduce blood glucose level on type II diabetes mellitus clients. She did the study by quantitative design with non randomization of sample selection. Lady's finger juice 150ml was given to the client per day for 28 days. The group was assigned into two. One is the control group and the other is the treatment group. The result shows that there is a significant difference between the two groups ($p>0.05$), a marked reduction in the treatment group than control group. The study concluded that lady's finger juice is effective in reducing the blood glucose level on type II diabetes mellitus clients.

CHAPTER III

METHODOLOGY

RESEARCH METHODOLOGY

The Methodology of research refers to the principle and idea on which researcher base their procedure and strategies (Polit and Hungler, 2002).

Methodology is a significant part of any research which enables the researcher to organize the procedure of collecting reliable data for the problem under study or investigation. This chapter deals with the description of methodology and the various steps adopted to collect and organize data for the study.

Research methods are the techniques used by the researcher to structure a study to gather and analyse information relevant to research question (Polit and Beck,2004).

The methodology section includes the research approach, research design, variables, settings, population, sample, sample size, sampling techniques, sampling criteria, development and description of the tool, content validity, reliability, pilot study, ethical consideration, method of data collection, plan for data analysis and protection of human rights.

RESEARCH APPROACH

The research approach involves the description of in the plan to investigate the phenomenon understudy in a quantitative, qualitative or a combination of the two methods. Furthermore, it helps to decide whether the presence or absence as well as manipulation and control over variables (Derise F Polit, 2011).

Quantitative research approach was used for this study.

RESEARCH DESIGN

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to complain relevant to the research purpose with economy in procedure (Hungler, 2004).

The research design adopted for this study was the true experimental pre and post test design.

The research design chosen for this study is presented in the figure as follows:

Group	Pre-test	Intervention	Post-test
Experimental	O_1	X	O_2
Control	O_1	-	O_2

Key:

O1- pre test blood glucose level among experimental and control group.

X - administered lady's finger juice to the experimental group.

O2- post test blood glucose level among experimental and control group.

SETTING OF THE STUDY

Setting is the more specific places where data collection occurs. The selection of setting was done on the basis of feasibility of conducting the study, availability of samples and co-operation of the authorities (Polit and Beck, 2004).

The study is planned to be conducted in Cherikadai and Alathurai area in Kanyakumari district which is 4 km away from the college and 1km away from the Primary health center, Palliyadi and also has the difference of 2 km in between the villages. The population covered in Cherikadai and Alathurai area was 23,363. The control group was selected in Cherikadai area and the experimental group was in Alathurai area through randomization.

VARIABLES

Variables are concepts at different level of attributes that a consciely defined to promote their measurement or manipulation within study (Derise F Polit, 2011).

Variables are classified as dependent variables and independent variables.

Dependent variables:

Variable causing change is referred to the dependent variable. It is the intervention or treatment that the investigator performs to see the resulting change in the dependent variable (Polit and Hungler, 2004).

Dependent variable is clients with Type II diabetes mellitus.

Independent variables:

It is the focus of the study and reflect as the empirical aspects of the concepts being studied (Polit and Hungler, 2004).

Independent variable is effect of lady's finger juice.

Demographic variables:

A variable that confounds the relationship between the independent and dependent variables and that needs to be controlled either in the research design or through statistical procedures (Polit and Hungler, 2004).

The present study demographic variables were age, sex, occupation, food pattern and duration of diabetes mellitus.

STUDY POPULATION

A population is defined as the entire set of individuals or objects having some common characteristics (Derise F Polit, 2011).

The study population comprised of clients with Type II diabetes mellitus aged 45-60years whose blood glucose is between 121-180mg/dl residing in Cherikadai and Alathurai village at Kanyakumari district.

SAMPLE

A sample consist of the subset of the population selected to participate in the research study (Polit and Beck, 2012).

In this study the samples were clients with Type II diabetes mellitus aged 45-60 years between the blood glucose level of 121-180mg/dl and also who fullfill the inclusive criteria residing in Cherikadai and Alathurai village at Kanyakumari district.

SAMPLE SIZE

Sample size is the total number of study participants participating in a study (Polit, 2008).

The sample size is determined based on the type of study, variables being studied, the statistical significance required and availability of samples and feasibility of conducting the study.

The sample size of the study was 60, among them 30 samples were allotted to Experimental group and remaining 30 samples were allotted to Control group through randomization.

SAMPLING TECHNIQUES

It is the process of selecting the subject from a population in order to obtain information regarding a phenomenon in a way that represents the entire population (Polit, 2010).

In this study researcher selected the samples by simple random sampling technique and the samples are selected through survey method.

CRITERIA FOR SAMPLE SELECTION

The sample was selected based on the following inclusion and exclusion criteria.

Inclusion criteria:

The criteria designated their specific attributes of the target population by which people are selected for inclusion in a selected study (Polit, 2012).

This study included the sample with the following traits:

Type II diabetes mellitus clients

- whose blood glucose is between 121-180mg/dl on random blood glucose.
- with the age group of 45-60 years.
- who are willing to participate in the study.

Exclusion criteria:

Sampling criteria specifying characteristics that a population does not have (Polit, 2012).

This study excluded the sample with the following traits:

Type II diabetes mellitus clients

- who were not willing to participate in the study.
- those who are taking medications.
- whose blood glucose more than 181mg/dl on random blood glucose.
- who were not available at that time of data collection.

DESCRIPTION OT THE TOOL

The tool is a written device that a researcher uses to collect the data. The tool consists of two sections.

Section A:

Comprised of demographic data of the samples which consists of age, sex, occupation, food pattern and duration of diabetes mellitus.

Section B:

It deals with glucometer used to determine the blood glucose level.

INTERVENTION OF LADY'S FINGER JUICE

The investigator developed interventional strategy on Lady's Finger Juice by reviewing literature and obtaining expert opinion. Lady's finger juice is prepared by one medium sized lady's finger. Take two pieces of lady's finger and remove or cut both ends of each piece. Also put a small cut in the middle and put these two pieces in glass of water (150ml). Cover the glass and keep it in room temperature overnight. Early morning, before breakfast simply remove two pieces of lady's finger from the glass and drink that water. The procedure is continued for 30 days.

CONTENT VALIDITY

Content validity of the tool was established by 6 experts including 5 nursing experts in the field of Community Health Nursing and a medical officer. The experts were requested to give their opinion and suggestion for further modification of items to improve the clarity and content of the items. The final tool was prepared as per the suggestions and advices given by the experts.

RELIABILITY

The tool used in this study was standardized one.

PILOT STUDY

The pilot study was done after obtaining permission from the medical officer of Primary health centre, Palliyadi and the family members from Nattalam area. The investigator introduced herself to the study subjects and established good rapport. Then the investigator gave a short introduction about her study. The pre test blood glucose level was assessed by glucometer on the 1st day. The samples were selected using the simple random sampling technique. Six samples were selected for the study. In that, three samples were allotted for experimental group and three samples were allotted for control group through randomization. Lady's finger juice was given for the experimental group for 30 days. The post test blood glucose level was evaluated for both groups by using glucometer.

METHOD OF DATA COLLECTION

After obtaining approval of the study by the dissertation committee of Global College of Nursing, formal approval from the medical officer and written consent from each participants, the investigator preceded with the data collection.

. The study was conducted at Cherikadai and Alathurai village from 1-04-2016 t0 30-04-2016. The investigator screened the Type II diabetes mellitus cases from the Primary health centre, Palliyadi. There are 1314 new cases were identified by this year 2016. Then the investigator started the data collection procedure through survey method. Introduction about investigator was given to samples. Good rapport was established, assured that information would be kept confidential. The 60 samples were selected by simple random sampling technique based on inclusion criteria. Glucometer was used for data collection as a tool.

Investigator selected 30 samples from Alathurai village for Experimental group and 30 samples from Cherikadai village for Control group. The pre test was conducted through glucometer to Experimental group and Control group. Then the investigator gave Lady's finger juice once a day for 30 days to the Experimental group. Intervention was not given for Control group. After intervention, the investigator conducted post test for Experimental group and Control group.

PLAN FOR DATA ANALYSIS

Both descriptive and inferential statistics were used to analyze the data.

Descriptive statistics:

1. Frequency and percentage distribution was used to analyze the demographic variables.
2. Frequency and percentage distribution was used to evaluate the blood glucose level.
3. Mean and standard deviation was used to evaluate the effectiveness of lady's finger juice in the blood glucose level.

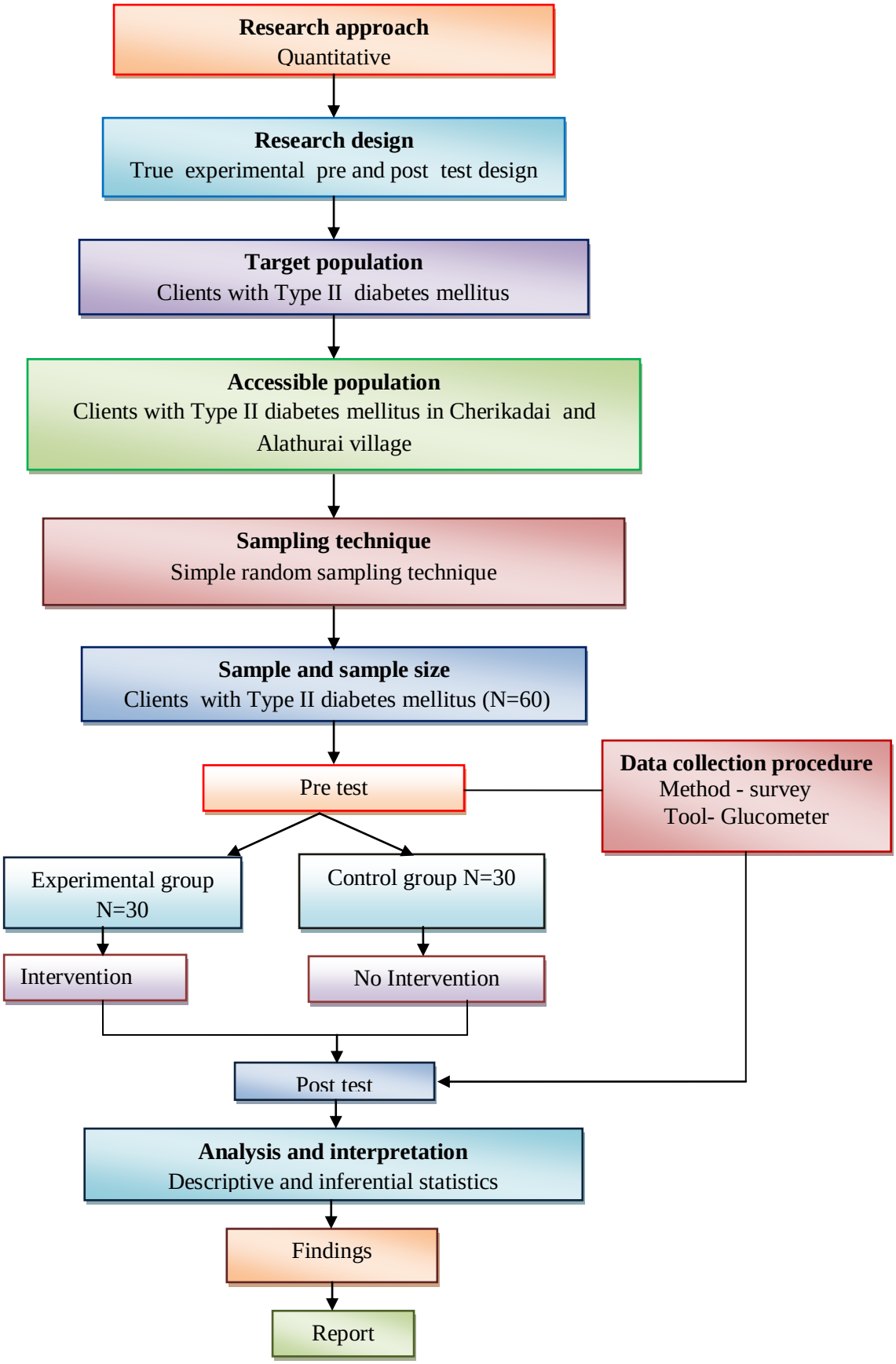
Inferential statistics:

1. Paired‘t’ test was used to compare the pre test and post test blood glucose level in Experimental and Control group.
2. Chi -square test was used to find out the association of the pre test blood glucose level in Experimental group and Control group with the selected demographic variables.

PROTECTION OF HUMAN RIGHTS

The proposed study was conducted after the approval of the dissertation and ethical clearance committee of Global College of Nursing. Formal permission was obtained from the medical officer of Primary health centre, Palliyadi. Informed written consent was obtained from each participants of the family before starting the data collection.

Schematic representation of research design



CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

Research data must be processed and analyzed in an orderly fashion so that patterns and relationship can be discerned and validated, and hypothesis can be tested. Quantitative data analyzed through statistical analysis includes simple procedures as well as complex and sophisticated methods.

This chapter deal with the analysis and interpretation of the data collected from clients with Type II diabetes mellitus. The interpretation of tabulated data can bring to light the real meaning of findings of the study. In order to find meaningful answers to the research questions the collected data must be processed and analyzed in some orderly coherent fashion, so that patterns and relationships can be discerned. In this study, the data was analyzed based on the objectives and hypothesis of the study using descriptive and inferential statistics.

The study findings are presented in sections as follow:

Section A:

Frequency and percentage distribution of the sample according to the demographic variables in Experimental group and Control group.

Section B:

(i) Assessment of blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group before intervention.

(ii) Assessment of blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group after intervention.

Section C:

i. Comparison of pre test and post test blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group.
ii. Comparison of post test blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group.

Section D:

Association between the pre test blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group with their demographic variables.

SECTION A:

Frequency and percentage distribution of the sample according to the demographic variables in Experimental group and Control group.

Table: 1

Frequency and percentage distribution of demographic variables among clients with Type II diabetes mellitus with respect to age, sex, occupation, food pattern and duration of diabetes mellitus in Experimental group and Control group

(N = 60)

Sl. No	Demographic Variables	Experimental Group		Control Group	
		F	%	F	%
1	Age				
	a) 45-50 years	10	33.33	9	30.00
	b) 51-55 years	9	30.00	10	33.33
	c) 56-60 years	11	36.67	11	36.67
2	SEX				
	(a) Male	14	46.67	15	50.00
	(b) Female	16	53.33	15	50.00
3	OCCUPATION				
	a) Sedentary Worker	12	40.00	11	36.67
	b) Moderate Worker	11	36.67	10	33.33
	c) Heavy Worker	7	23.33	9	30.00
4	FOOD PATTERN				
	a) Vegetarian	8	26.67	7	23.33
	b) Non-Vegetarian	22	73.33	23	76.67
5	DURATION OF DIABETES MELLITUS				
	a) Since 3 month	9	30.00	10	33.33
	b) Since 6 month	11	36.67	9	30.00
	c) Since 1 year	10	33.33	11	36.67

Table:1 shows the distribution of sample according to the age in Experimental group, out of 30 samples 10 (33.33%) were 45-50years of age, 9 (30%) of them were 51-55years of age, 11 (36.67%) were 56-60 years of age , and in control group 9 (30%) were 45-50years of age, 10 (33.33%) of them were to 51-55years of age, 11 (36.67%) were 56-60 years of age.

Dispersion of sample according to the sex in experimental group out of 30 samples 14 (46.67%) were males, 16 (53.33%) were females, and in control group 15 (50%) were males, 15 (50%) were females.

Distribution of sample according to the occupation in the experimental group, out of 30 samples 12 (40%) belonged to sedentary worker, 11 (36.67%) of them belonged to moderate worker, 7 (23.33%) belonged to heavy worker and in Control group 11 (36.67%) belonged to sedentary worker, 10 (33.33%) of them belonged to moderate worker and 9 (30%) belonged to heavy worker.

Distribution of sample according to the food pattern in the experimental group, out of 30 samples 8 (26.67%) belonged to vegetarian, 22 (73.33%) of them belonged to non vegetarian and in Control group 7 (23.33%) belonged to vegetarian and 23 (76.67%) of them belonged to non vegetarian.

Distribution of samples according to the duration of diabetes mellitus in experimental group, out of 30 samples 9 (30%) belonged to since 3 month, 11 (36.67%) belonged to since 6 month, 10 (33.33%) belonged to since one year and in Control group out of 30 samples 10 (33.33%) belonged to since 3 month, 9 (30%) belonged to since 6 month and 11 (36.67%) belonged to since 1 year.

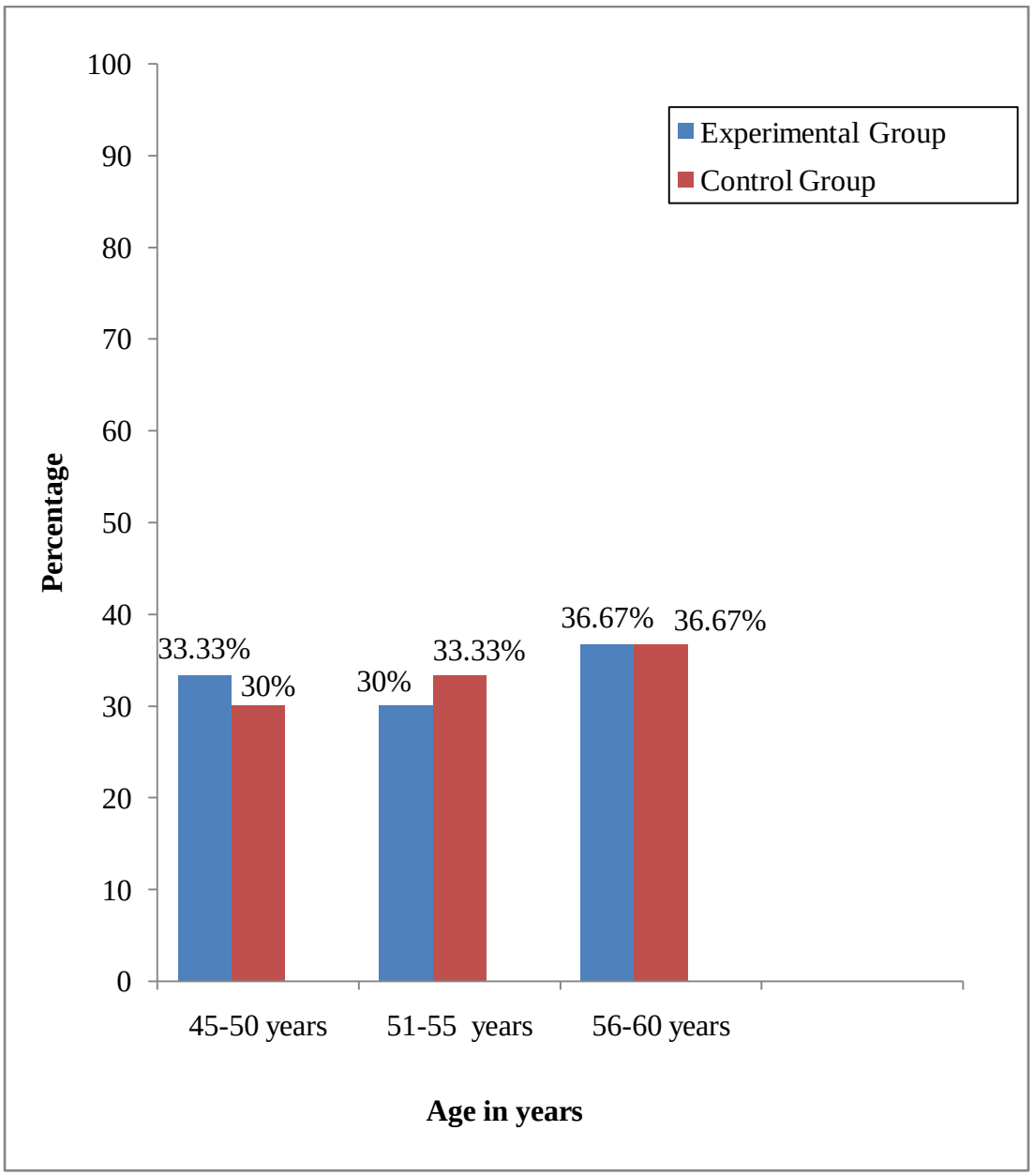


Figure 3: Percentage Distribution of Samples According to their Age

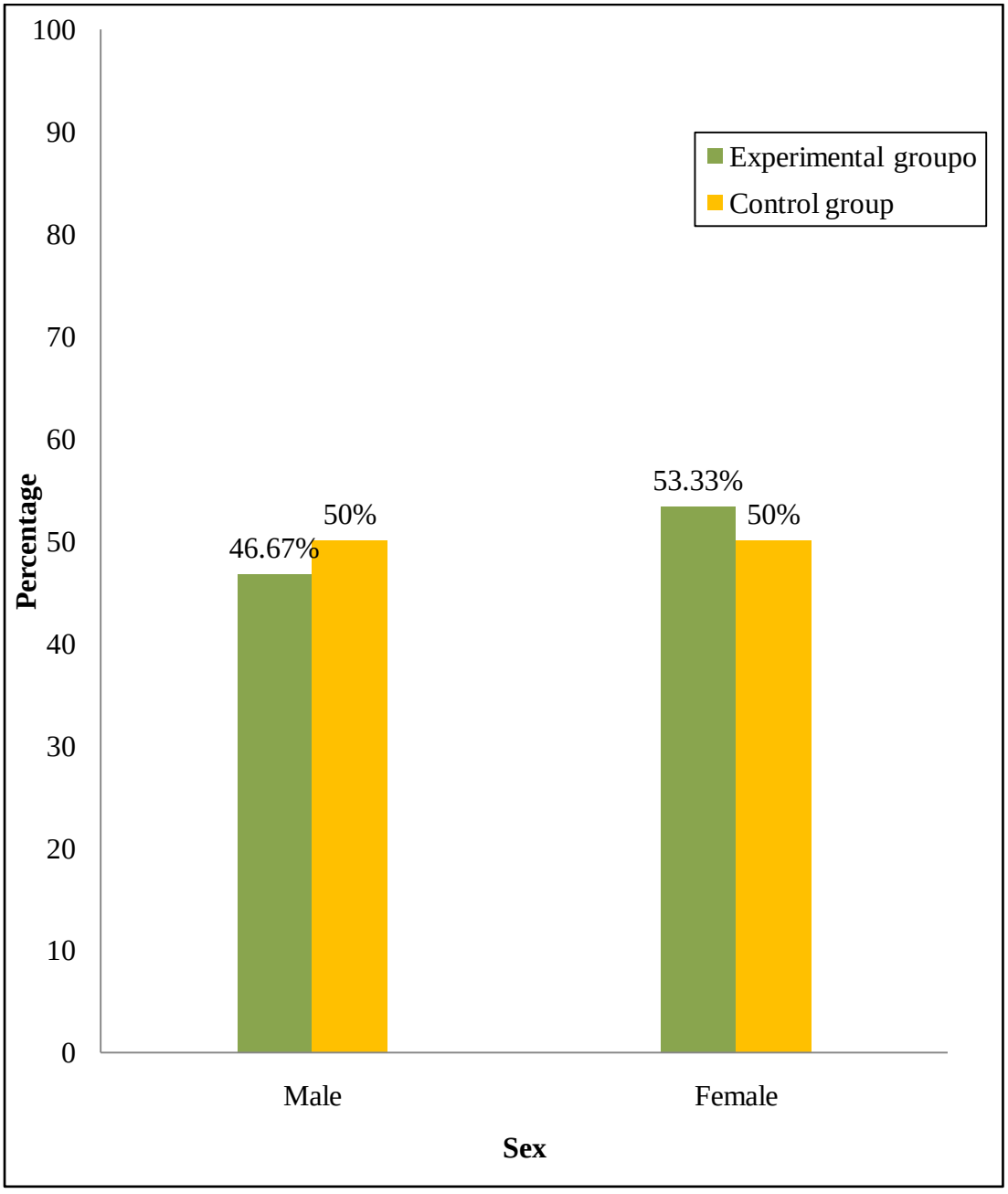


Figure 4: Percentage Distribution of Samples According to their Sex

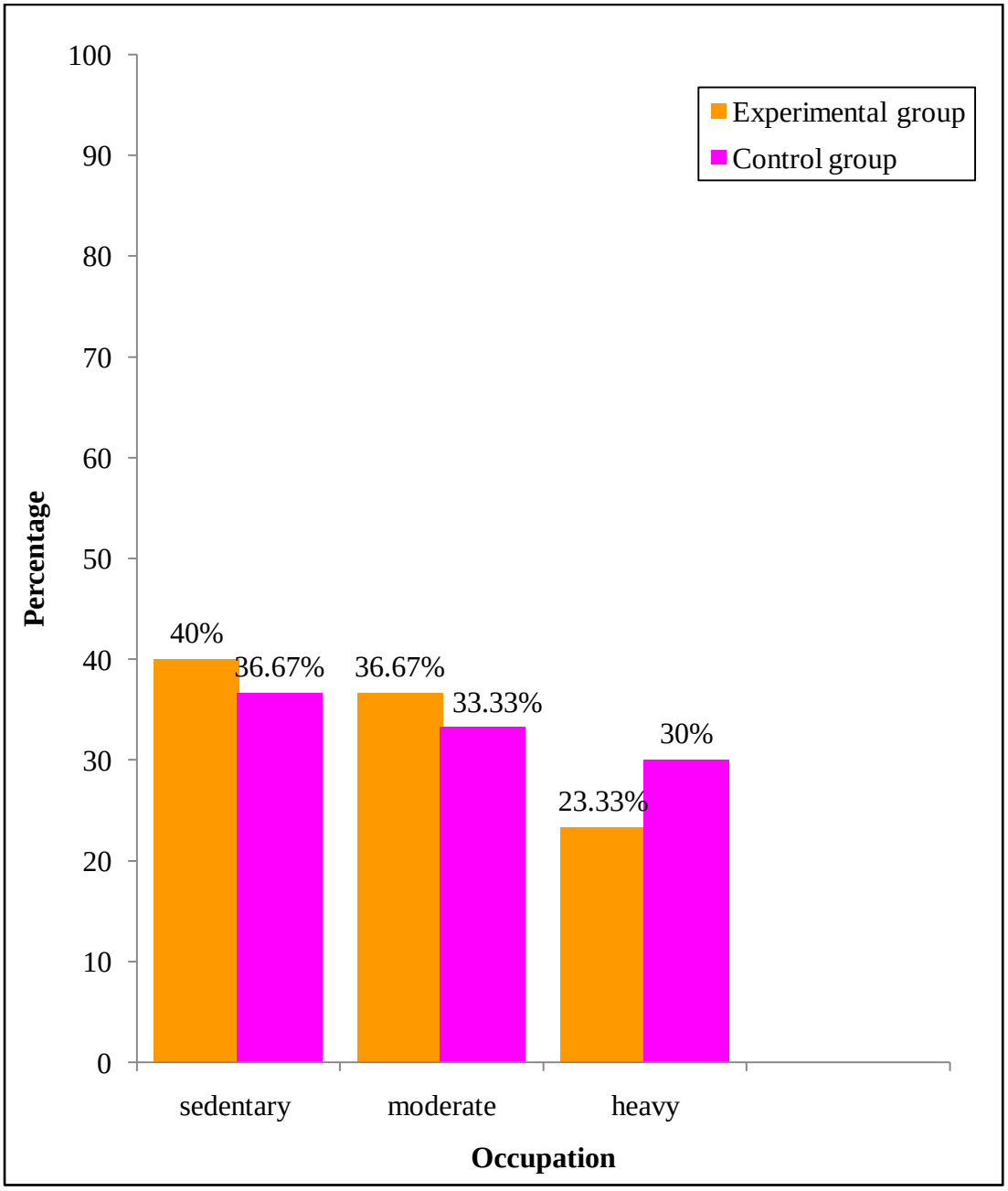


Figure 5: Percentage Distribution of Samples According to their Occupation

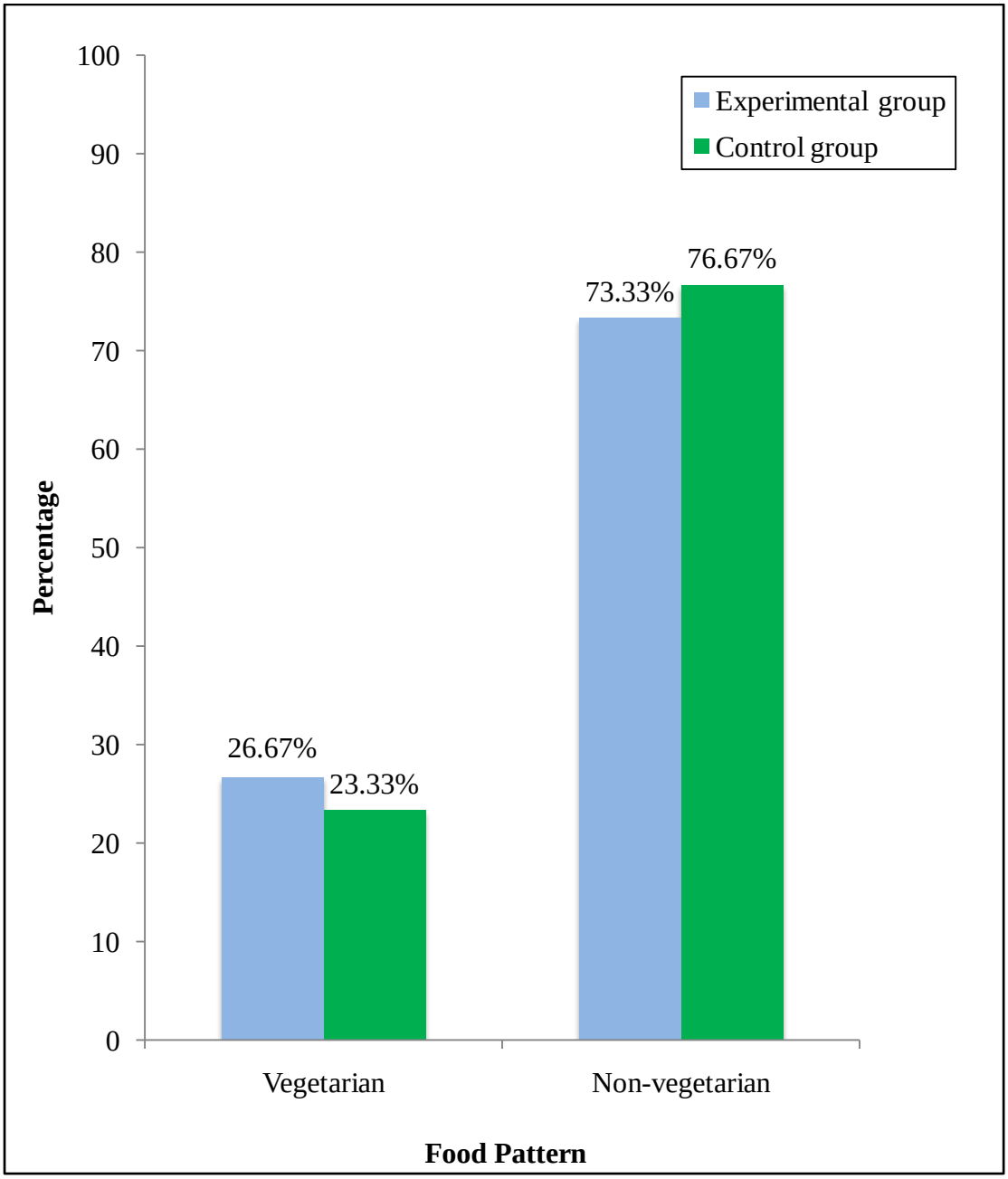


Figure 6: Percentage Distribution of Samples According to their Food Pattern

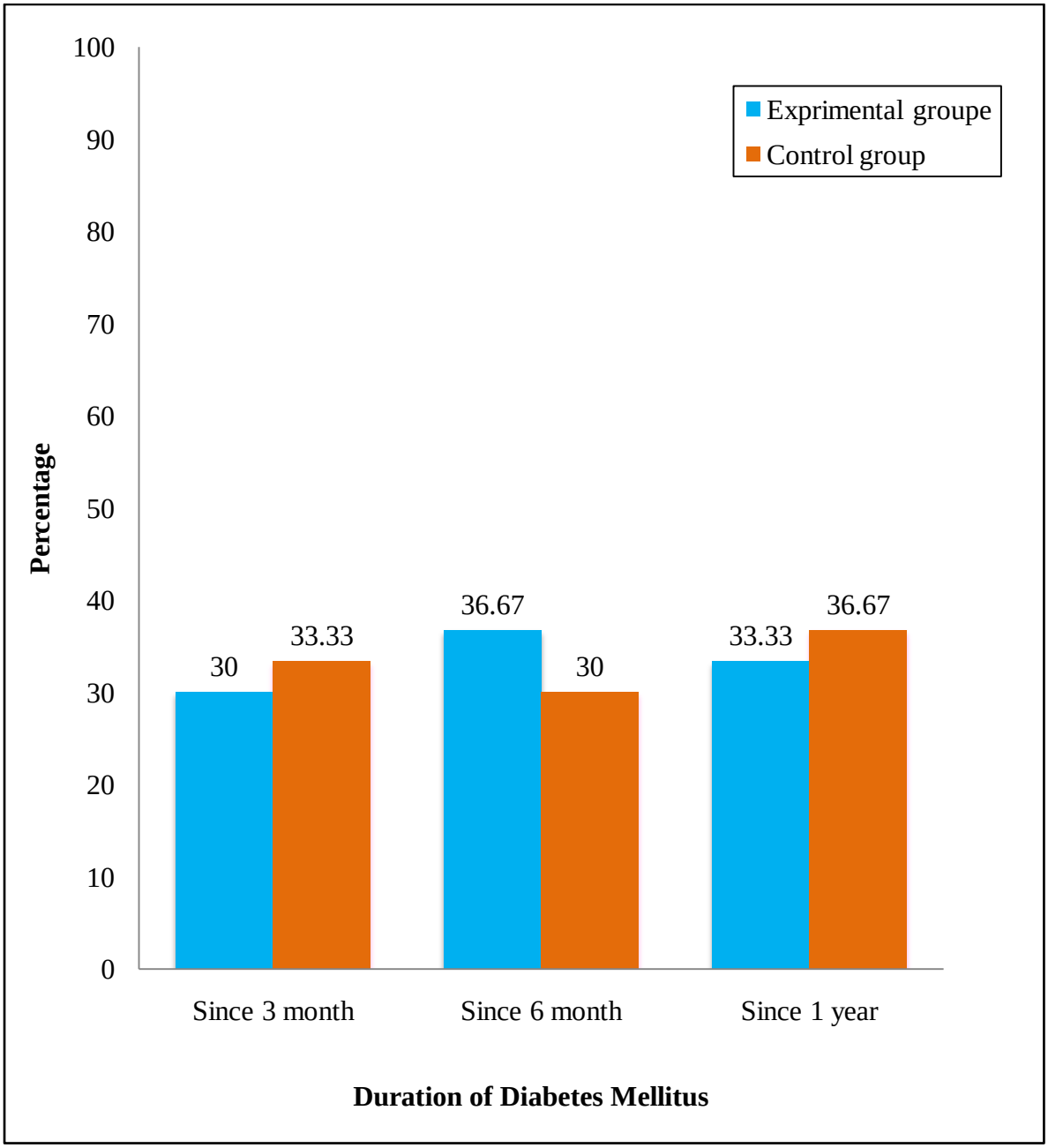


Figure 7: Percentage Distribution of Samples According to their Duration of Diabetes Mellitus

SECTION B:

Assessment of blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group before intervention.

Table: 2

Frequency and percentage distribution among clients with Type II diabetes mellitus according to the blood glucose level in Experimental group and Control group before intervention N=60

S.No	CATEGORY	Pre Test			
		Experimental Group N=30		Control Group N=30	
		F	%	F	%
1	Normal	0	0	0	0
2	Mild Hyperglycemia	6	20	7	23.33
3	Moderate Hyperglycemia	18	60	17	56.67
4	Severe Hyperglycemia	6	20	6	20.00

During pretest, in Experimental group 0 (0%) had Normal blood glucose, 6 (20%) had mild hyperglycemia, 18 (60%) had moderate hyperglycemia and 6 (20%) had severe hyperglycemia. In Control group, 0 (0%) had Normal blood glucose, 7 (23.33%) had mild hyperglycemia, 17 (56.67%) had moderate hyperglycemia and 6 (20%) had severe hyperglycemia.

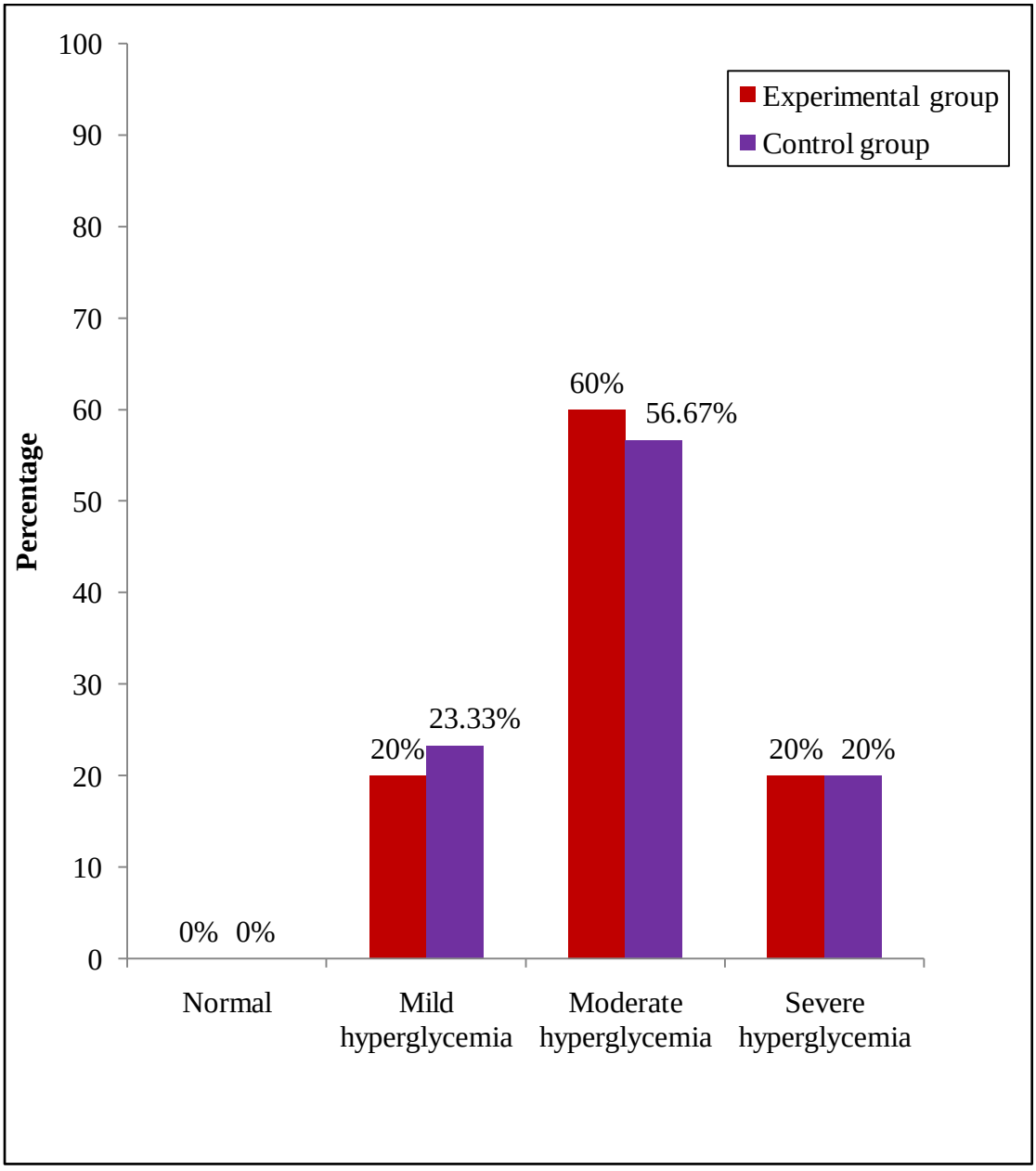


Figure 8: Distribution of Sample According to the Blood Glucose Level before Intervention (Pre test)

Assessment of blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group after intervention.

Table: 3

Frequency and percentage distribution among clients with Type II diabetes mellitus according to the blood glucose level in Experimental group and Control group after intervention N =60.

S.No	CATEGORY	Post Test			
		Experimental Group N=30		Control Group N=30	
		F	%	F	%
1	Normal	17	56.67	0	0
2	Mild Hyperglycemia	10	33.33	9	30.00
3	Moderate Hyperglycemia	3	10.00	16	53.33
4	Severe Hyperglycemia	0	0	5	16.67

During posttest, in Experimental group, 17 (56.67%) had Normal blood glucose, 10 (33.33%) had mild hyperglycemia, 3 (10%) had moderate hyperglycemia and 0 (0%) had severe hyperglycemia. In Control group, 0 (0%) had Normal blood glucose, 9 (30%) had mild hyperglycemia, 16 (53.33%) had moderate hyperglycemia and 5 (16.67%) had severe hyperglycemia.

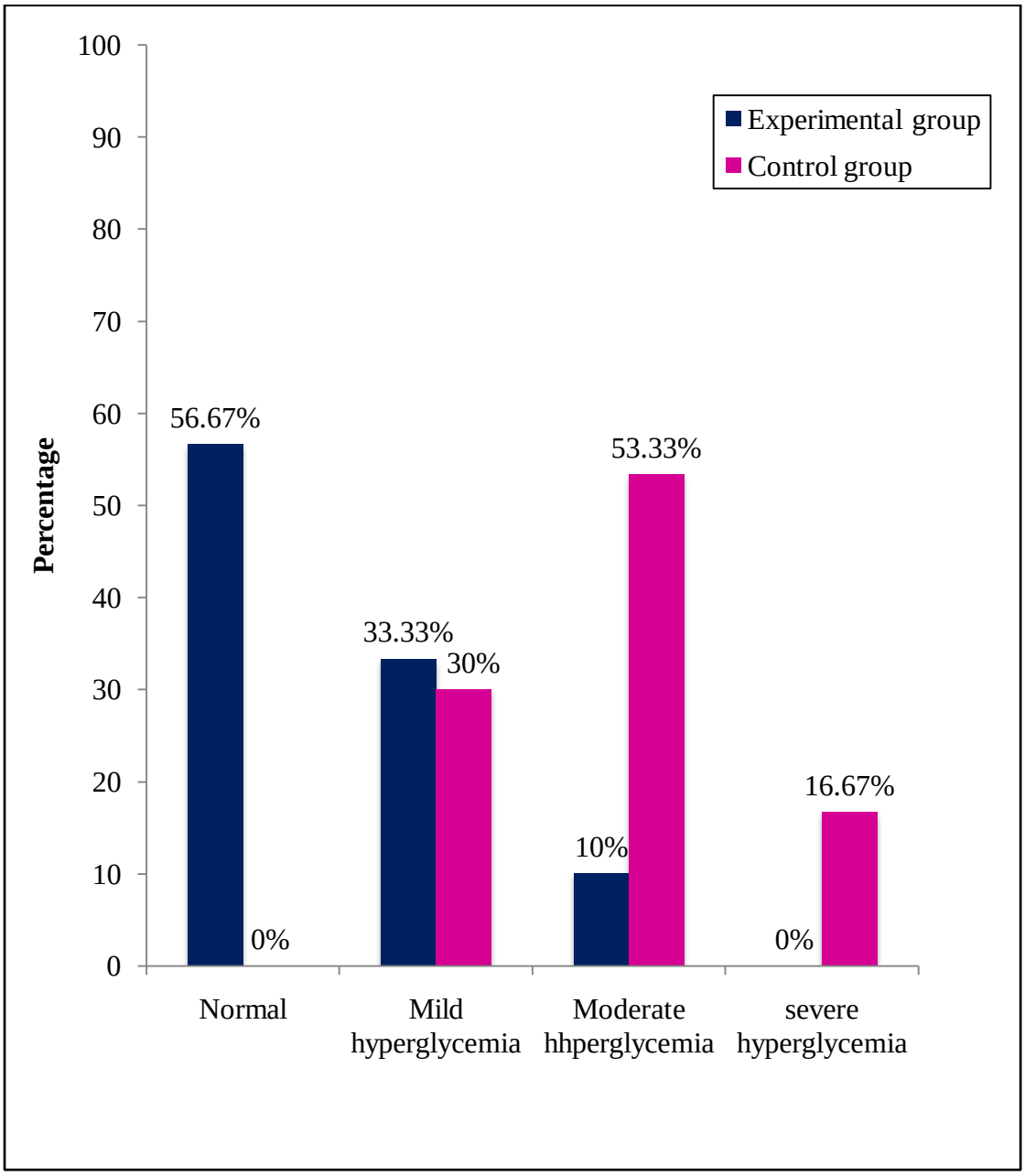


Figure 9: Distribution of Sample According to the Blood Glucose Level after Intervention (Post test)

SECTION C:

Comparison of Pre test and Post test blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group.

Table: 4

Mean, Standard deviation and Paired 't' value on Pre and Post test blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group N=60.

S.No	Group	Mean	SD	Mean Difference	Paired 't' test	df	5% level of Significance
1	Experimental Group						
	Pre Test	153.00	14.09	24.80	13.76	29	2.042 Significant
	Post Test	128.20	14.54				
2	Control Group						
	Pre Test	147.63	13.87	6.43	3.99	29	2.042 Significant
	Post Test	154.06	14.24				

Table: 4 represents, the mean score on blood glucose level in Experimental group was 153 in pre test and 128.20 in post test. The paired 't' value was 13.76 which is significant at p >0.05. It shows that lady's finger juice was effective in reducing the blood glucose level among clients with Type II diabetes mellitus. Hence the research hypothesis (H_1) is accepted.

In Control group the mean score on blood glucose level was 147.63 in pre test and 154.06 in post test. The paired 't' value was 3.99 which is significant at p >0.05.

Comparison of Post test blood glucose level among clients with Type II Diabetes mellitus in Experimental group and Control group.

Table: 5

Mean, Standard deviation and 't' value on blood glucose level among clients with Type II diabetes mellitus in Experimental group and Control group after intervention N=60.

S.No	Group	Mean	SD	Mean Difference	't' value	df	5% level of Significance
1	Experiment	28.20	14.54	25.86	6.93	58	2.0 Significant
2	Control	54.06	14.24				

Table: 5 represents, the mean score on blood glucose level in Experimental group was 128.20 in post test and 154.06 in Control group post test. The estimated value was 6.93 which is significant at $p > 0.05$. It shows that lady's finger juice was effective in reducing the blood glucose level among clients with Type II diabetes mellitus. Hence the research hypothesis (H_2) is accepted.

SECTION D:

Table: 6 Association between the Pre test blood glucose level among clients with Type II diabetes mellitus of selected demographic variables in Experimental group and Control group.

S.No	Demographic Variables	Experimental Group	χ^2	df	Control Group	χ^2	5% level of significance
1	Age						
	a) 45-50 years	10			9		9.49
	b) 51-55 years	9	9.63	4	10	9.86	S
	c) 56-60 years	11			11		
2	SEX						
	a) Male	14	0.53	2	15	0.83	5.99
	b) Female	16			15		NS
3	OCCUPATION						
	a) Sedentary Worker	12			11		
	b) Moderate Worker	11	10.14	4	10	9.98	9.49
	c) Heavy Worker	7			9		S
4	FOOD PATTERN						
	a) Vegetarian	8	2.72	2	7	3.12	5.99
	b) Non-Vegetarian	22			23		NS
5	DURATION OF DIABETES MELLITUS						
	a) Since 3 month	9			10		9.49
	b) Since 6 month	11	12.81	4	9	9.86	S
	c) Since 1 year	10			11		

Table: 6 shows that in experimental group, there is a significant difference between age, occupation, and duration of diabetes mellitus and non-significance of sex and food pattern.

In control group, there is a significant difference between age, occupation, and duration of diabetes mellitus and non-significance of sex and food pattern.

There is no association between Pre test blood glucose level among clients with Type II diabetes mellitus in experimental group and control group with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

CHAPTER - V

DISCUSSION

This chapter deals with the discussion of the data analyzed based on the objective and hypothesis of the study. The problem stated was an experimental group, a study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanyakumari District. The discussion was based on the objectives and hypothesis of the study.

Objectives

- To assess the pre and post test blood glucose level among clients with Type II diabetes mellitus in experimental and control group.
- To determine the effectiveness of lady's finger juice on blood glucose level among clients with Type II diabetes mellitus in experimental and control group.
- To find out the association between the pre test blood glucose level among clients with Type II diabetes mellitus with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

The first objective was to assess the pre and post test blood glucose level among clients with Type II diabetes mellitus in experimental and control group.

In experimental group, the blood glucose level among clients with Type II diabetes mellitus in pre test out of 30 samples 6 (20%) belongs to mild hyperglycemia, 18 (60%) belongs to moderate hyperglycemia and 6 (20%) belongs to severe hyperglycemia. In control group out of 30 samples 7 (23.33%) belongs to mild hyperglycemia, 17 (56.67%) belongs to moderate hyperglycemia and 6 (20%) belongs to severe hyperglycemia. In post test the blood glucose level among clients with Type II diabetes mellitus in experimental group 17 (56.67%) had normal blood glucose level, 10 (33.33%) had mild hyperglycemia, 3 (10%) had moderate hyperglycemia and there is no severe hyperglycemia. In control group there is no normal blood glucose level, 9 (30%) had mild hyperglycemia, 16 (53.33%) had moderate hyperglycemia and 5 (16.67) had severe hyperglycemia.

Jegan (2013), conducted a study to assess the hypoglycemic effect of a common food item known as Lady's finger. Sixty clients were randomly selected and grouped into 2 groups and were given extracts from the vegetable of Lady's finger which was cut into two pieces and was soak in 150ml potable water overnight. 1st group is the Control Group and the 2nd group is the Treatment Group. Average results of the two groups are determined and recorded upon conducting this experimental research. The Control Group has an average result of 94mg/dl in the 1st test (pre test) and 99mg/dl in the 2nd test (post test), The Treatment Group has an average result of 115mg/dl in the 1st test (pre test) and 88mg/dl in the 2nd test (post test). The results indicated that the extract from Lady's finger juice has hypoglycemic effect to reduce the Type II diabetes mellitus. There is a significant difference between the two groups ($P<0.001$). The study concluded that the post test value is decreased due to Lady's finger juice to reduce the Type II diabetes mellitus. Hence the research hypothesis (H_1) is accepted.

The second objective was to determine the effectiveness of lady's finger juice on blood glucose level among clients with Type II diabetes mellitus in experimental and control group.

The mean score on blood glucose level among clients with Type II diabetes mellitus in experimental group was 128.20 with standard deviation 14.54 and in Control group, the mean score was 154.06 with standard deviation 14.24.The mean difference was high and statistically significant. It shows that lady's finger juice was effective in improving the blood glucose level among clients with Type II diabetes mellitus.

Poltanov, E.A. (2015), conducted a study to assess the effectiveness of lady's finger juice in the control of blood glucose level among type 2 diabetes mellitus clients aged 45-60 years in selected areas. A true experimental research approach with simple random sampling technique was used. Data collection was done by baseline proforma, compliance diary and random blood glucose monitoring chart. The results revealed the mean random blood glucose value of the experimental group in the pretest (259.6±60.3) on the first day and post test (204.3±54.6) on the 30^{th} day .The study concluded that the decline in the mean random blood glucose value in the experimental group due to the administration of lady's finger juice. Hence the research hypothesis (H_2) is accepted.

The third objective was to find out the association between the pre test blood glucose level among clients with Type II diabetes mellitus with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

In experimental group, there is a significant difference between age, occupation, and duration of diabetes mellitus and non-significance of sex and food pattern.

In control group, there is a significant difference between age, occupation, and duration of diabetes mellitus and non-significance of sex and food pattern.

There is no association between the pre test blood glucose level among clients with Type II diabetes mellitus in experimental group and control group with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

CHAPTER - VI

SUMMARY, CONCLUSION, NURSING IMPLICATION AND RECOMMENDATIONS

This chapter deals with the summary of the study, conclusion drawn, nursing implications and recommendations of the study.

Summary

Quantitative evaluative approach with True experimental design was used to determine the effectiveness of lady's finger juice among clients with Type II diabetes mellitus in selected villages. The conceptual framework was based on General System Theory of Ludwig Von Bertalanffy (modified) (1968) as explained by Newby (1996). The tool used in the study consisted of two parts. Part one was demographic variables and the part two was glucometer. Simple random sampling technique was used to collect the sample and the data was collected from the study participant in experimental group and control group. The data were collected and analyzed by using descriptive and inferential statistics. The level of significance was assessed by p > 0.05 to test the hypothesis.

Findings

In Experimental group the mean score on blood glucose level among clients with Type II diabetes mellitus was 153 in pre test and 128.20 in post test. The paired't' value was 13.76 which is significant at p >0.05. In Control group the mean score on blood glucose level among clients with Type II diabetes mellitus was 147.63 in pre test and 154.06 in post test. The paired 't' value was 3.99 which is significant at p >0.05. It shows that lady's finger juice was effective in reducing the blood glucose level. The mean score on blood glucose level among clients with Type II diabetes mellitus in Experimental group was 128.20 in post test and 154.06 in Control group post test. The estimated value was 6.93 which is significant at P> 0.05. It shows that lady's finger juice was effective in reducing the blood glucose level. There is no association between the pre test blood glucose level among clients with Type II diabetes mellitus

in experimental group and control group with their selected demographic variables such as age, sex, occupation, food pattern and duration of diabetes mellitus.

Conclusion

From the result of the study it was concluded that lady's finger juice was effective in reducing the blood glucose level among clients with Type II diabetes mellitus. The lady's finger is available at all places with cheaper cost.

Implications

The researcher has derived the following implications from the study results which are of vital concern to the field of nursing practice, nursing education, nursing administration and nursing research.

Implications for Nursing Practice

- Nursing person should develop in depth knowledge about Type II diabetes mellitus in adults.
- Nurses should be knowledgeable regarding the benefits and effects of lady's finger juice.
- Nurses should promote and encourage lady's finger juice as home remedy for Type II diabetes mellitus clients.

Implications for Nursing Education

- The nurse educators need to be equipped with adequate knowledge regarding the lady's finger juice for Type II diabetes mellitus clients.
- Nursing students should receive adequate training regarding the benefits of lady's finger juice.
- Conduct workshops or conferences for students regarding the use of lady's finger juice for Type II diabetes mellitus clients in day today nursing practice.

Implications for Nursing Administration

- Nurse administrator should be take initiate to conduct the periodical in service education programme in order to minimize the complication of Type II diabetes mellitus.

- ❖ Nurse administrator should emphasize and encourage the staff regarding the administration of lady's finger juice.
- ❖ Nursing administrator can organize conferences, seminars, and workshops for nurses to encourage the lady's finger juice as home remedy for Type II diabetes mellitus.

Implications for nursing research

- ❖ Nurses should conduct research to further clarify the benefits and optimal association of lady's finger juice for Type II diabetes mellitus clients.
- ❖ Encourage further research to be conducted regarding the effects of lady's finger juice for Type II diabetes mellitus clients.
- ❖ Disseminate the findings of research through conferences, seminars, and publishing in nursing journals.

Recommendations

The following studies can be undertaken to strengthen lady's finger juice on reducing blood glucose level as a good remedy for Type II diabetes mellitus clients.

- ❖ A similar study can be conducted with increased in the sample size.
- ❖ A similar study can be conducted among another Type II diabetes mellitus clients.
- ❖ A similar study can be conducted in various community settings.

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APPENDICES: A

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

Tel. (O) : 273297
270753

GLOBAL COLLEGE OF NURSING

Recognised by the TNC & INC
Affliated to Tamil Nadu Dr. M.G.R. Medical University
Edaivilagam, Nattalam, Kanyakumari District.

Off: S.G. Multi Speciality Hospital, Old Theatre Jn, Pammam, Marthandam - 629 165,
K.K. Dist., Tamil Nadu. Mob : 9443606955, 9941104286

Lr.No:GCN/74/04/2016

To

The Medical Officer,
Primary Health Centre,
Cherikadai.

Sir,

Sub: Permission seeking letter for the conduct of research-Reg.

This is to request you to kindly permit Mrs.SUBHA.R.C, 2nd year M.Sc. (N), from Global College of Nursing to conduct her research study.

STATEMENT OF THE STUDY

"A STUDY TO ASSESS THE EFFECTIVENESS OF LADY'S FINGER JUICE ON REDUCING THE BLOOD GLUCOSE LEVEL AMONG TYPE II DIABETES MELLITUS CLIENTS IN SELECTED AREA AT KANYAKUMARI DISTRICT"

So kindly consider this letter and do the needful.

Thanking You,

Yours,
Principal
GLOBAL COLLEGE OF NURSING
Edavilagam, Nattalam,
Kanyakumari District - 629 165

GLOBAL COLLEGE OF NURSING
NATTALAM, K.K. DIST. - 629 165

மருத்துவ அலுவலர்
அரசு ஆரம்ப சுகாதார நிலையம்
பள்ளியாடி - 629 169

APPENDICES: B

ETHICAL CLEARANCE CERTIFICATE

Tel. (O) : 273297
270753

GLOBAL COLLEGE OF NURSING

Recognised by the TNC & INC
Affliated to Tamil Nadu Dr. M.G.R. Medical University
Edaivilagam, Nattalam, Kanyakumari District.

Off: S.G. Multi Speciality Hospital, Old Theatre Jn, Pammam, Marthandam - 629 165,
K.K. Dist., Tamil Nadu. Mob : 9443606955, 9944110448.

ETHICAL CLEARANCE CERTIFICATE

Mrs. Subha R.C. (Community Health Nursing)

Sub: Your letter dated 25/04/2015 for the approval of above reference study and its related documents.

Ref: "A study to assess the effectiveness of lady's finger juice on reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanayakumari District" Ethics committee of Global College of Nursing, Edavilagam, Nattalam, Marthandam. Reviewed and discussed the study proposal the documents submitted by you related to the content of the above referenced study and its meeting held on 04/05/2015.

The following Ethical committee members were present at the meeting held on 04/05/2015.

S.No.	Name	Profession	Position in the committee
1.	Prof. Josephine Ginigo	Nursing	Chair Person
2.	Dr. Sam.G.Jeba Joselin	Medical	Basic Medical Scientist
3.	Mrs. Vijila Berlin	Nursing	Clinician
4.	Adv. Sreenivasan	Legal	Legal Exports
5.	Prof. A. J. Benzam	Social	Social Scientist
6.	Dr. Ahilan	Management	Philosopher
7.	Mr. Sujin	Lay person	Community Person

After due Ethical and scientific consideration, the ethics committee has approved the above presentation submitted by you.

With Regards

.....

Prof. Josephine Ginigo
Ethics Committee Chair Person
Global College of Nursing, Edavilagam, Nattalam

Date :04/05/2015
Place: Nattalam

GLOBAL COLLEGE OF NURSING NATTALAM, K.K. DIST. 629 165

Principal
GLOBAL COLLEGE OF NURSING
Edavilagam, Nattalam,
Kanyakumari District - 629 165

APPENDICES: C

LETTER SEEKING EXPERTS OPINION FOR VALIDITY OF TOOL

From

Subha R.C
II year M.Sc. Nursing,
Global college of nursing,
Nattalam.

To

Respected Sir/Madam,

I am doing M.Sc. Nursing in Global College of Nursing, Nattalam. As a partial fulfillment of the course, I have chosen a topic of my interest **"A study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanyakumari district."** I have prepared demographic data and standardized tool. I here kindly request you to evaluate the tool based on the evaluation criteria. Your opinion and suggestions will help me to the successful completion of my study.

Thanking you,

Place: Your's Faithfully,

Date: Subha R.C

APPENDICES: D

EVALUATION CRITERIA CHECK LIST FOR TOOL VALIDATION

Introduction

The expert is requested to go through the following criteria for evaluation. Three columns are given for responses and a coloumn for remarks. Kindly place tick mark in the appropriate column and give remarks.

Interpretation of column

Column I : Meets the criteria

Column II : Partially meet the criteria

Column III : Does not meet the criteria

Serial No	Criteria	1	2	3	Remarks
1	Scoring - Adequacy - Clarity - Simplicity				
2	Content - Logical sequence - Adequacy - Relevance				
3	Language - Appropriate - Clarity - Simplicity				
4	Practicability - It is easy to score - Does it precisely - Utility				

Signature :

Name :

Designation :

Address :

Any other Suggestion

APPENDICES: E

LIST OF EXPERTS FOR TOOL VALIDATION

1. **Dr. Ashwin Pradeep, MBBS**
   Medical Officer,
   Primary Health Centre,
   Cherikadai.

2. **Mrs. Sahaya Selvi, M.Sc., (N)**
   Principal,
   Grace College of Nursing,
   Padanthalumoodu.

3. **Mrs. Feby. G, M.Sc., (N)**
   Vice -Principal,
   Thasiah College of Nursing,
   Marthandam.

4. **Mrs. Jasmin Shylaja. M, M.Sc., (N)**
   Vice –Principal,
   CSI College of Nursing,
   Marthandam.

5. **Mrs. Anbu Malar. J, M.Sc., (N)**
   Reader,
   White Memorial College of Nursing,
   Attoor.

6. **Mrs. Anitha. S, M.Sc., (N)**
   Lecturer,
   P. S. College of Nursing,
   Thalakulam.

APPENDICES: F

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Mrs. Subha R.C,** II year M.Sc. Nursing of Global College of Nursing, Nattalam, has done a dissertation study **"A study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanyakumari district."**

This study was edited for English Language appropriateness by

Mr. Helendy Solomon, M.A., M.E.D., M.Phil.

Signature:

APPENDICES: G

PERMISSION LETTER

PERMISSION LETTER

I **Mrs. SubhaR C,** M.sc (N) II year student of Global college of nursing, conducting A study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus in selected villages at Kanyakumari district as a partial fulfillment of the requirement for the degree of M.sc (N). Lady's finger juice will be provided to the client for 30 days. Glucometer is the tool used to assess the level of blood glucose. So, I request you to kindly permit to prick the clients to take the value of pre test and post test for my study.

Thanking you

Signature

MEDICAL OFFICER
GOVT. PRIMARY HEALTH CENTRE
PALLIYADI - 629 169

APPENDICES: H

INFORMED CONSENT

Dear Client,

I, **Mrs. Subha R.C,** M.Sc. Nursing, II year student of Global College of Nursing, conducting "a study to assess the effectiveness of lady's finger juice in reducing the blood glucose level among clients with Type II diabetes mellitus" as a partial fulfillment of the requirement for the degree of M.Sc. Nursing under the Tamil Nadu Dr. M.G.R. Medical University. Lady's finger juice is provided to the client for 30 days. The pre and post test value is checked through Glucometer. I assure you that information obtained will be kept confidential. So, I request you to kindly co operate with me and participate in this study by giving your frank and voluntary consent.

Thank you,

Signature:

APPENDICES: I

TOOLS FOR DATA COLLECTION

SECTION-A

DEMOGRAPHIC VARIABLES

1. Age
    a) 45-50 years
    b) 51-55 years
    c) 56-60 years

2. Sex
    a) male
    b) female

3. Occupation
    a) sedentary worker
    b) moderate worker
    c) heavy worker

4. Food pattern
    a) vegetarian
    b) non-vegetarian

5. Duration of diabetes mellitus
    a) since 3 month
    b) since 6 month
    c) since 1 year

SECTION-B

GLUCOMETER

Glucometer

A glucometer is a medical device for determining the approximate concentration of glucose in the blood.

Blood Glucose Meter and Test Strips

Procedure

1. Obtain a glucometer and test strips
2. Test the glucometer before using it
3. Wash the hand s thoroughly including the area from which are the area going to draw blood
4. Place alcohol on a cotton ball.
5. Place a test strip into the slot provided on the glucometer.swab the area that was going to use to draw the sample from within the cottonball.
6. Wait for the readouton the diabetic glucometer to tell you to put,the drop of blood on the strip.
7. Use the lancet provided with the diabetic glucometer and prick the area for the sample.
8. Place a drop of blood on the test strip.
9. Wait for results.
10. Read and record the results.

APPENDICES: J

PROCEDURE

PREPARATION OF LADY'S FINGER JUICE

Lady’s finger juice is prepared by one medium sized lady’s finger. Take two pieces of lady’s finger and remove or cut both ends of each piece. Also put a small cut in the middle and put these two pieces in glass of water (150ml). Cover the glass and keep it in room temperature overnight. Early morning, before breakfast simply remove two pieces of lady’s finger from the glass and drink that water. **Keep doing it on daily basis. Within one month, the blood glucose level will be reduced.**

APPENDICES: K

PHOTOGRAPHS